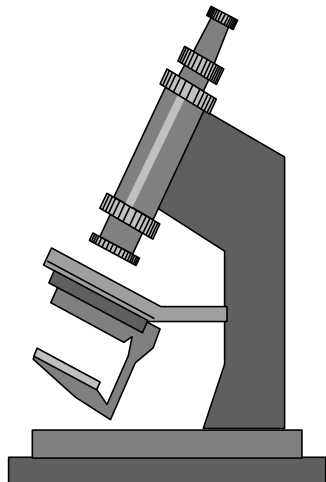


SW-CMM Appraisal Process Overview



<http://sepo.spawar.navy.mil/>



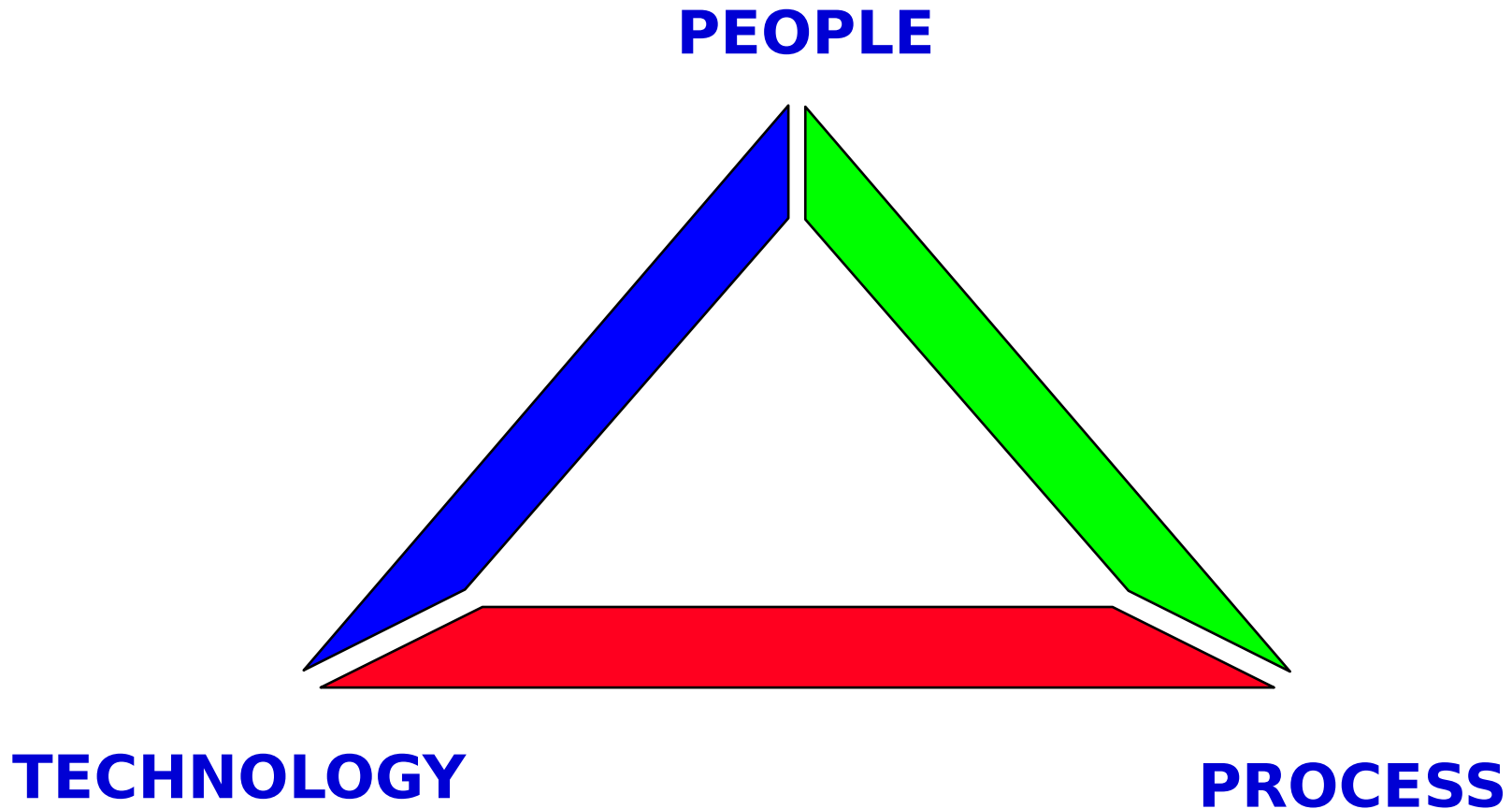
Objectives

- Understand the appraisal process
- Review what you need to know if involved in an appraisal

Assumptions

- **Familiar with the Software CMM**
- **Understand of the SSC San Diego Software Process Improvement Initiative**
- **Have attended SPIRIT, SME, and/or SPM courses**
- **Involved in the SPI initiative as a SPI Agent or member of a SPI project**
- **Understand the need for SPI**

Predictable Quality depends on



Software Engineering Initiatives

Software Engineering Institute - Est. by DOD in 1984

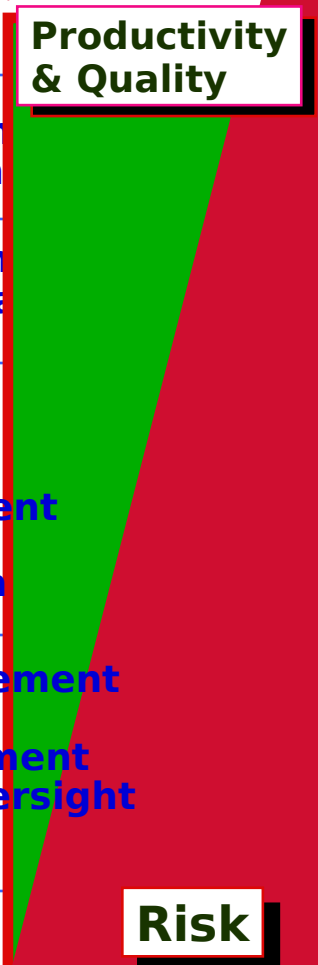
- Improve software quality and productivity
- Provide leadership in software process management
- Accelerate maturity of software engineering profession

Software Engineering Process Office (SEPO) - Established by SSC San Diego in 1989

- Implement a software process improvement program
- Learn how SSC San Diego develops software
- Improve software estimations
- Improve software quality and productivity

Software Engineering Process Policy - July 2000

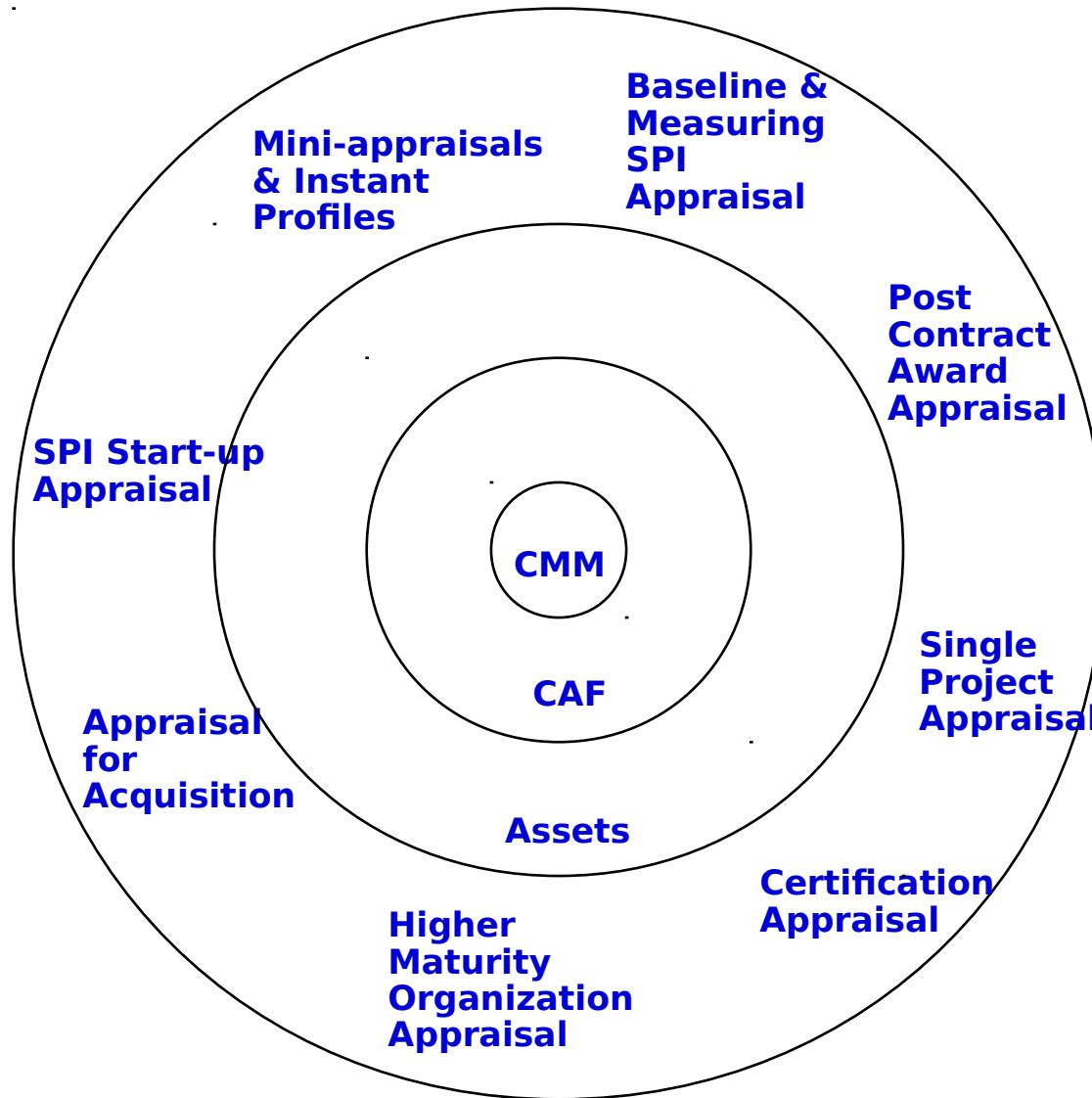
SEI Capability Maturity Model

			Result
Level	Characteristic	Key Process Areas	Productivity & Quality
Optimizing (5)	Continuous process capability improvement	Process change management Technology change management Defect prevention	
Managed (4)	Product quality planning; tracking of measured software process	Software quality management Quantitative process management	
Defined (3)	Software process defined and institutionalized to provide product quality control	Peer reviews Intergroup coordination Software product engineering Integrated software management Training program Organization process definition Organization process focus	
Repeatable (2)	Management oversight and tracking project; stable planning and product baselines	Software configuration management Software quality assurance Software subcontract management Software project tracking & oversight Software project planning Requirements management	
Initial (1)	Ad hoc (success depends on heroes)	"People"	Risk

Appraisals

- **Appraisal methodology originally developed by the SEI to measure an organization's software process maturity**
- **Other types of appraisals have been synthesized and tailored from the original methodology**
- **All methodologies should be compliant with the CMM Based Appraisal Framework (CAF) to ensure consistent results**

CMM Based Appraisals Concept

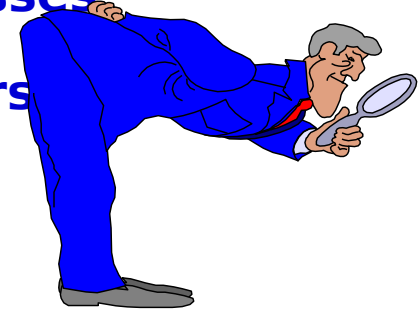


Appraisal Methodologies

- **Internal Process Improvement (IPI)**
- **Software Capability Evaluation (SCE)**

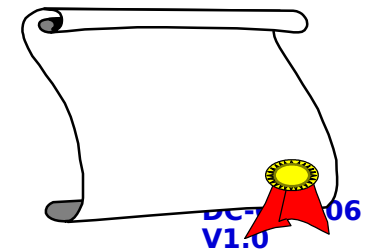
Why do an Appraisal?

- Identifies a software organization's strengths and weaknesses based on the SEI Capability Maturity Model
- Identifies a software organization's areas of risk and highlights areas for improvement in that organization's ongoing software projects
- Provides insight into "corporate" philosophy regarding software quality and capabilities
- Verifies use of proposed software processes
- Helps to identify the "best value" offerors for software contracts



Why do an Appraisal? (continued)

- Provides incentive to software organizations to improve the way they develop software
- Recognizes software organizations for improving software engineering processes
- SSC San Diego, the sponsor, and developer share in the results and consequences of software processes
- Reinforces Navy commitment to improve software quality
- Joint Navy and industry effort to improve software quality



Use of Appraisals At SSC San Diego

In Acquisitions

- Include requirement for Appraisal in RFP

During Life Cycle

- Initiate Appraisal

- Pre-on-site preparation and planning
 - Analyze responses
 - Request documents
 - Develop interview questions
 - Logistics

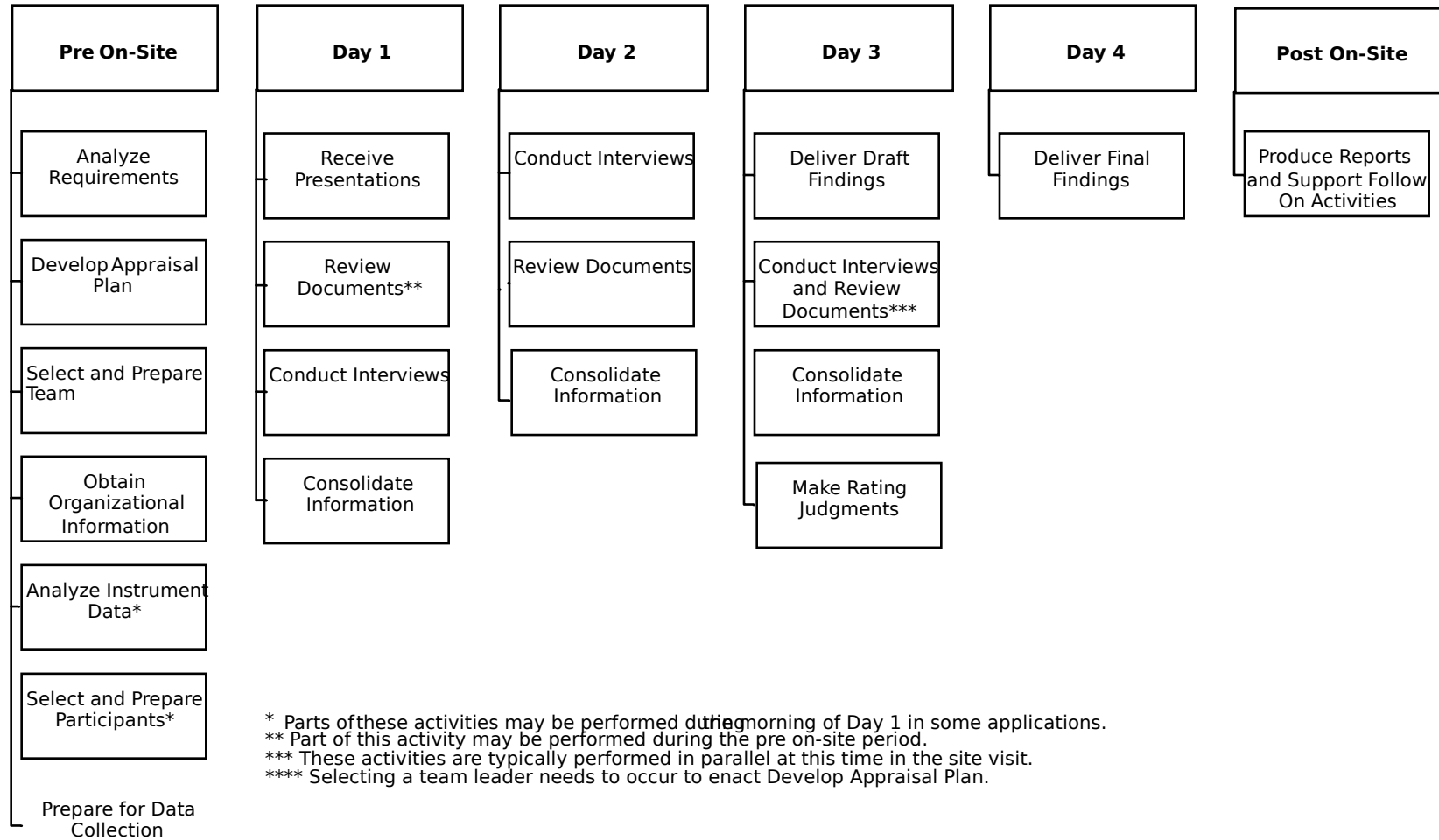
- Conduct on-site evaluation
 - Conduct interviews
 - Review documents
 - Give introductory and exit briefs

- Provide final results to SSEB

- Provide final results to requestor & org

- Compile lessons learned and implement process improvements

Typical Appraisal Process Flow



Appraisal Schedule

- **Sign-up Planning** **1 day - 6 months**
- **Preparation**
 Provide materials and POC
 Form evaluation team **30 days**
 Develop appraisal plan
- **Pre on-site Preparation** **14 days**
 Review contractor-provided materials
 Develop initial on-site schedule
 Send preparation letter
 Prepare appraisal team

Appraisal Schedule (continued)

- **On-site Evaluation** **5-10 days**
 - Conduct introductory brief**
 - Receive presentations**
 - Perform interviews and documentation reviews**
 - Formulate findings**
 - Deliver Preliminary Findings brief**
 - Deliver Final Findings brief**
- **Final Findings and Recommendations** **1-2 Weeks**
 - Report (optional)**

Sample On Site Schedule



SPAWAR
Systems Center
San Diego

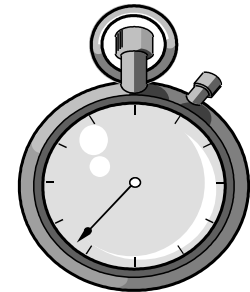
Day 1

Arrival/Sign-In/Set-Up	7:30 - 8:00
Introduction Brief	8:00 - 8:15
Project Presentations	8:15 - 9:15
Documentation Review	9 15 - 11:30
Lunch	11:30 - 12:30
Project 1 Interview	12:30 - 1:45
Team Discussion	1:45 - 2:00
Project 2 Interview	2:00 - 3:15
Team Discussions	3:15 - 3:30
Project 3 Interview	3:30 - 4:45
Team Discussions	4:45 - 5:00

1992						
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Day 2-4

Documentation Review	8:00 - 8:30
Team Discussions	8:30 - 9:00
Project 4 Interview	9:00 - 10:15
Team Discussions	10:15 - 10:30
SQA Interview	10:30 - 11:00
Team Discussions	11:00 - 11:15
CM Interview	11:15 - 11:45
Team Discussions	11:45 - 12:00
Lunch	12:00 - 1:00
Prg/Corp Mgt Interview	1:00 - 1:30
Team Discussions	1:30 - 1:45
SEPG Interview	1:45 - 2:15
Team Discussions	2:15 - 2:30
Follow-up Interviews	2:30 - 3:30
Team Discussions	3:30 - 5:00



Day 5

Team Discussions	8:00 - 10:00
Draft Findings	10:00 - 11:30
Lunch	11:30 - 12:30
Team Discussions	12:30 - 3:30
Final Findings	3:30 - 4:30

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Projected Costs

	<u>SEPO</u>	<u>Vendor</u>	<u>SPI Agent</u>
• Appraisal Conductor (6 persons) - Per SCE	(2 person s)	(2 persons)	(1 person)
- Salaries		6 pw	2 pw
- Travel	4 pw*	3 trips	0 trips
- Administration	0 trips	1 pw	0
- One Time Training	1 pw		
- Tuition		\$2000/per	\$2000/per
- Salaries	\$2000/per	1 wk/per	1 wk/per
• Appraisal Recipient	1 wk/per	1 trip/per	1 trip/per
- Travel	1 trip/per		
- Personnel Salaries/Travel		\$0 - 100,000	

* person weeks DC-OPF-06
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Appraisal Process Flow

- 1. Planning**
- 2. Preparing**
- 3. Collecting data**
- 4. Consolidating data**
- 5. Making judgments**
- 6. Reporting Results**
- 7. Follow-up actions**

1. Planning

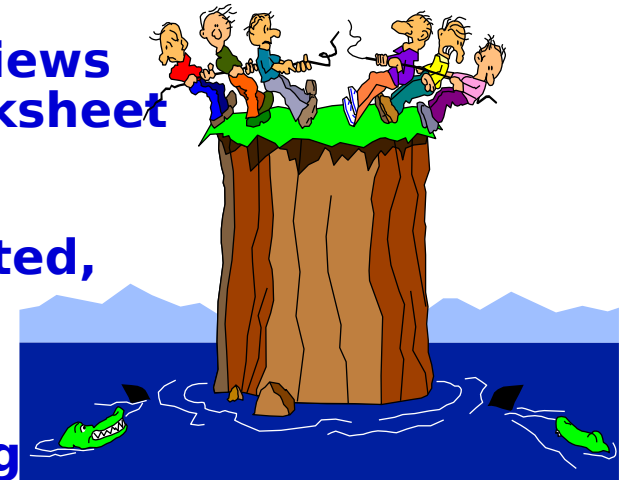
- Understand sponsoring activity's goals and objectives
- Determine model scope (depth and breadth)
- Select projects to be evaluated (4-5)
 - Product profile (domain, life cycle, size)
- Select, build, and train the appraisal team
 - team leader must be a certified Lead Appraiser
 - team members should be trained in Appraisal methodology
- Request project documentation
- Analyze MQ, Project Profiles, Org Charts, project documentation
- Determine data collection strategy (interviews, documents, briefings)
- Select individuals to be interviewed
- Script interview questions
- Prepare Appraisal Plan

2. Preparing

- **Logistics and scheduling**
- **Identify and schedule physical resources (site POC, private room, computer, internet access, copier, printer, etc)**
- **Prepare opening brief**
 - all appraisal participants should attend
- **Assign team roles**
- **Training**
- **Team building**

Team Roles

- **Leader**
 - Manages process
 - Focal point
 - Keeps to agenda
 - Guarantees deadlines and deliverables
- **Facilitator**
 - Encourages participation & team spirit
 - Appraisee "advocate"
 - Moves team toward consensus
 - Appraisal process monitor
- **Recorder**
 - Captures information
 - Takes notes during interviews
 - Maintains evaluation worksheet
- **Document tracker**
 - Tracks documents requested, received, reviewed
- **Timekeeper**
 - Helps allocate time among discussion topics



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Team Roles (continued)

- **Team leader, facilitator, recorder, document tracker and timekeeper are also team members**
- **Team members are usually assigned specific KPAs to monitor**
- **Teams should have at least 5 members**
- **All members should be knowledgeable on the CMM and the Appraisal methodology**
- **At least 2 team members with appraisal experience**
- **Team leader must be a certified lead appraiser**

3. Collecting Data

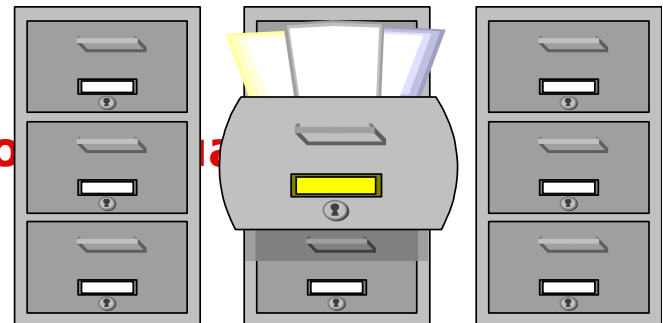
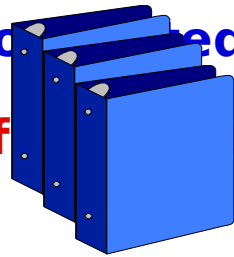
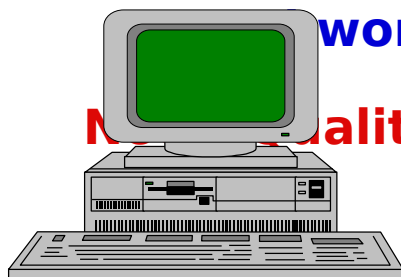
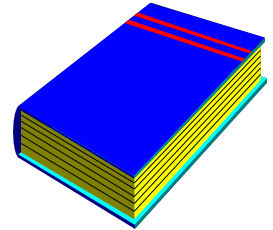
- **Fact, inference, judgment**
- **Data collection mechanisms**
 - Interviews
 - Document reviews (processes and artifacts)
 - Instruments
 - Project presentations
- **Observation sheets**
 - Inconsistencies and anomalies
- **Document log**
- **Information needed sheet**

Sample Questions From Questionnaire

- **"Does the project follow a written organizational policy for planning a software project ?"**
- **"Are the project's actual results (e.g. schedule, size, and cost) compared with estimates in the software plans?"**
- **"Is a documented procedure used for selecting sub-contractors based on their ability to perform the work?"**
- **"Does SQA provide objective verification that software products and activities adhere to applicable standards, procedures, and requirements?"**
- **"Are periodic audits performed to verify that software baselines conform to the documentation that defines them (e.g. by the SCM group)?"**
- **"Is consistency maintained across software work products (e.g. is the documentation tracing allocated requirements through software requirements, design, code, and test cases maintained)?"**

Sample Documentation Reviewed

- Procedures for estimating size, schedule, and cost and copies of last three estimates
- Organization charts showing relationships of senior management, software manager, SQA, and SCM
- Corporate policy on training requirements and a list of project personnel's completed training
- Last three tracking reports showing planned versus



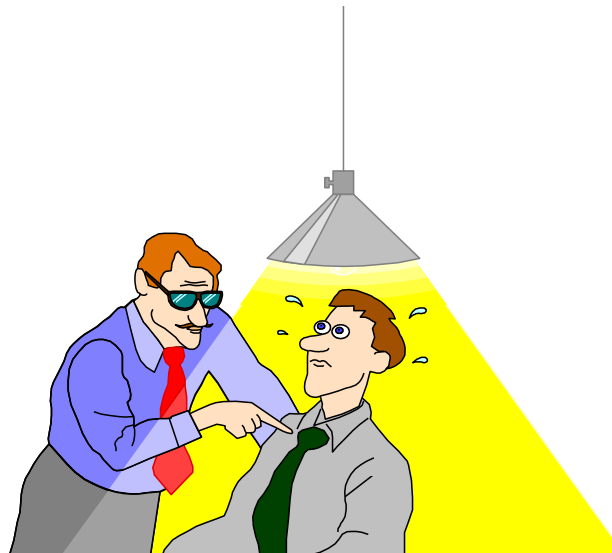
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Sample Interview Questions of a Project Manager

- "Show the evaluation team reports on how you manage the quality of software products."
- "How do you ensure only authorized changes are made?"
- "Explain the mechanism you use for ensuring software designers understand each software requirement."
- "How do you track progress?"



Interviewing

- **Types of interviews:**
 - individual
 - group
- **Critical Skills:**
 - listening
 - taking notes
- **Ask open-ended questions (not “yes/no”)**
- **Repeat what interviewee says for clarification**
- **Avoid CMM jargon**
- **Non-verbal communication**
- **Meet with team immediately after interview to discuss observations**
- **Additional documentation may also be requested at this time**
- **Follow-up interviews may also be conducted**

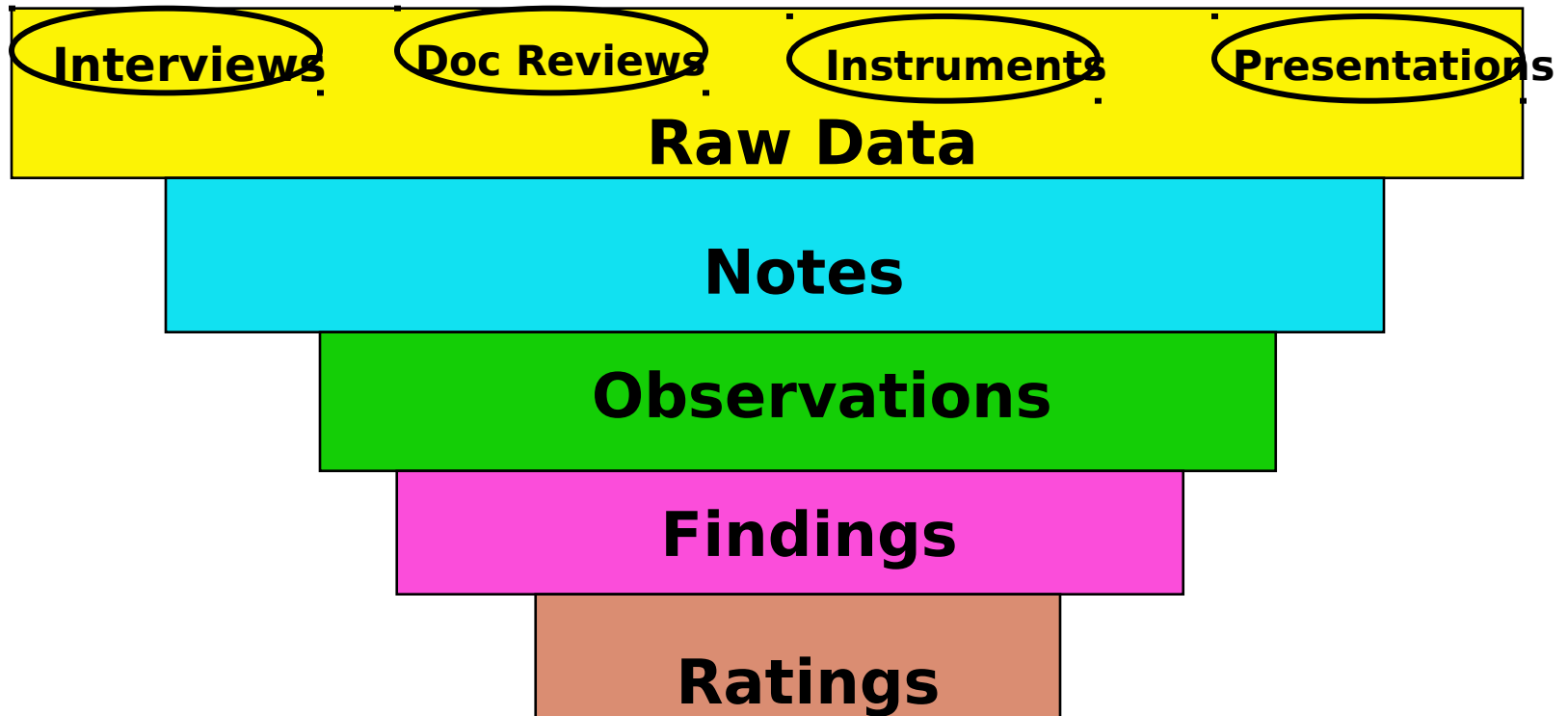
4. Consolidating Data

- **Organize information to be collected**
- **Summarize and combine information (observation sheets)**
- **Determine if information is sufficient for rating judgments**
 - If not, what else needs to be collected?
- **Observations should be based on fact or strong inferences**
- **Observations should be sufficiently corroborated**
 - at least 2 pieces of evidence (e.g. document, interview)
- **Observations should not conflict with other validated observations or findings**
- **Determine if observations fully cover the KPA under investigation**
- **Consolidation of data is a crucial part of a successful appraisal**

5. Making Judgments

- **Achieve consensus**
 - everyone can publicly support the decision
- **Minimize the number of judgments**
- **Make judgments at the lowest possible level**
- **Base judgments on facts or strong inferences**
- **Types of judgments**
 - accuracy
 - corroboration
 - consistency
 - coverage

Data Transformations



6. Reporting Results

- Rate only those items that are:
 - planned to be rated
 - fully covered
 - fully corroborated
- Rating Level is based on achieving KPA goals
 - If any common features are not totally satisfied, then the Level cannot be achieved
 - some practices can be not satisfied and still satisfy that KPA
- Draft findings are presented to allow comments from appraised organization
- Findings can be presented in presentation and documented report format
- Findings always include process area profiles and summaries, and findings
- Findings may include maturity level rating, risks, and/or recommendations
- Findings are provided to appraisal sponsor
- Findings are to be treated as confidential

Results of an Appraisal: Findings (per KPA) and/or Rating Level



Strengths

Items that reduce risk



Weaknesses

Items that increase risk



Improvement Activities

Indicates potential future risk reduction

3

And/Or

Rating Level

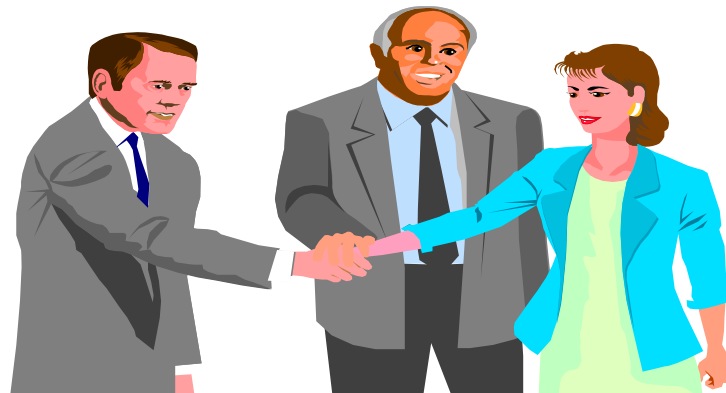
1
2
4

5

Appraisal Process

Findings are effective if they:

- **Motivate improvement in developer process capability, and benefit the acquisition**
- **Provide data to help the program office identify, assess, and reduce program risks**
- **Enable acquisition organizations to be process oriented without specifying practices**
- **Allow SSC San Diego, the sponsor, and the developer to share in the results and consequences of software processes**



7. Follow-Up Actions

- **Determine if appraisal met sponsor needs**
- **Help sponsor interpret results**
- **Determine how the organization should use the results**

What You Need To Know If You Are Involved In An Appraisal

- **Think Organizationally!**
- **Understand the SSC San Diego SPI Initiative**
- **Review materials from SME/SPIRIT and SPM courses**
 - **SME Guidebook**
- **Know what the Organization's Standard Software Process is and be able to describe its contents**
"A Description of the SSC San Diego of Software Process Assets" (SPA)
<http://sepo.spawar.navy.mil/>
- **Know how your project has tailored the standard software process**
 - **Know the Center's 3 life cycle models (Waterfall, Evolutionary, Incremental)**
- **Know what the Organization Software Process Database is**
 - **PDFs and Peer Review data are inputs to the database**
 - **Be familiar with the Baseline Data Analysis Report on the SPI web site**

What You Need To Know If You Are Involved In An Appraisal (continued)

- Know about the Software Engineering Process Policy (SPAWARSYSCENINST 5234.1)
<http://iweb.spawar.navy.mil/services/sti/publications/inst/SSCSD/5234-1.html>
- Know about the SSC San Diego Process Asset Library and assets on it
<http://sepo.spawar.navy.mil>
- Be able to describe how both project and SPI Status is reviewed by senior management
 - Appendix G of the Software Measurement Plan Template (PPT Template)
 - SPI Status briefs to the Business Board
- Know what your project's processes and artifacts are and how to find them
- Be familiar with your Department and Project SPI Plans
- Be familiar the SSC San Diego Software Engineering Training Plan and your project Training Plan
- Know how to use your Dept. PAL
- Know who your SPI Agent and SPI Lead are

Interview Do's and Don'ts

- **Arrive on-time**
- **Relax!**
- **Be prepared**
- **Be open and honest**
- **Don't give "canned" answers**
- **Think carefully before giving responses**
- **Don't make-up answers; it's OK to not know everything!**
- **Be courteous and respectful**
- **Report back lessons learned to the project and SEPO**

Summary

The purpose of an appraisal is to:

- Reinforce SSC San Diego commitment to improve software qu
- **Questions?**

